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General Electric Company  
CRD Patent Docket Rm 4A59  
P.O. Box 8, Bldg. K-1  
Schenectady, NY 12301

EXAMINER
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KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
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1755

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s) 	
	10/644,103	SETLUR ET AL.	
	Examiner	Art Unit	
	C. Melissa Koslow	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/14/05 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/14/04</u> .   | 6) <input type="checkbox"/> Other: ____.                                    |

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The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 25-32 been renumbered 27-32.

The subject matter of line 23 on page 22 through line 2 on page 23 is a claim which has been numbered claim 25.

The subject matter of lines 3-4 on page 23 is a claim which has been numbered claim 26.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: #352 in paragraph [0058] is not on fig. 7. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: # 220 in fig 6. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the

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specification to add the reference character(s) in the description in compliance with 37 CFR

1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities: There are no degree symbols in the specification. Applicants need to clarify if all the elements listed in the parenthesis of formulas, where there is no subscript, need be present or if only at least one need be present. In the art, both interpretations are applicable. Thus, applicants need to make clear their interpretation of these formulas. Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The subject matter of claim 28, a radiation source that emits radiation in the wavelength range of about 250 nm to about 420 nm, is not found in the specification.

Claims 6, 10 and 20 are objected to because of the following informalities: The degree symbols are missing from these claims. Appropriate correction is required.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled

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in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claim 20 teaches the amount of europium is about 10-40 at%, based on the combined amount of A and europium ions, while paragraphs [0020] and [0022] teach the amount of europium is about 10-50 at%, preferably about 20-40 at%, based on the combined amount of A and europium ions. The discrepancies between the claimed range and the ranges in the specification need to be corrected.

Claims 23, 24, 26, 31, 32 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 23 and 24, applicants need to clarify if all the elements listed in the parenthesis of formulas, where there is no subscript, need be present or if only at least one need be present. In the art, both interpretations are applicable. Thus, applicants need to make clear their interpretation of these formulas. Claims 26, 31 and 32 are all improperly dependent on claim 24. Claim 24 is directed to a phosphor blend, not a light source. Claims 26 and 31 should be dependent on claim 25. Claim 32 should be dependent on claim 31 since this is the teaching in the claims of gas discharge devices. Claim 34 is also improperly dependent on claim 24. It is noted that paragraph [0059] teaches the phosphor of claim 1 can be used in cathode-ray tubes and there is no teaching of the use of a cathode ray tube as a radiation source that emits wavelengths in the range of about 250-480 nm.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6, 7, 10, 11, 13, 25, 31 and 33 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 2000-109826.

This reference teaches a fluorescent lamp comprising a phosphor having the formula  $Ba_{1-x-y}Sr_xEu_yMg_{1-z}Mn_zAl_{10}O_{17}$ , where x is 0.4-0.6, y is 0.03-0.3 and z is 0-0.04. The phosphor is produced by mixing carbonates of barium, strontium and magnesium; europium oxide; manganese oxide, magnesium hydroxide, alumina and aluminum fluoride flux and firing the mixture at 1200-1700°C in a reducing atmosphere for 2-40 hours. The examples teach a firing temperature of 1450°C, a firing time of 24 hours and an atmosphere is a blend of nitrogen and hydrogen. The y values in the examples 0.1 and the z range values are 0.008-0.025. These values fall within the range of claim 6. The taught phosphor is blended with a red and green phosphor and used in a fluorescent lamp, which is known in the art to comprise a gas discharge device that emits ultraviolet radiation of about 250 nm. The reference teaches the claimed process and device.

Claims 6, 7, 10, 11, 13, 25, 31 and 33 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 08-283712.

This reference teaches a fluorescent lamp comprising a phosphor having the formula  $Ba_{1-x-y}Sr_xEu_yMg_{1-z}Mn_zAl_{10}O_{17}$ , where x is 0.1-0.4, y is 0.075-0.4 and z is 0.005-0.05. The phosphor is produced by mixing carbonates of barium, strontium and magnesium; europium

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oxide; manganese oxide, magnesium hydroxide, alumina and aluminum fluoride flux and firing the mixture at 1200-1700°C in a reducing atmosphere for 2-40 hours. The examples teach a firing temperature of 1450°C, a firing time of 24 hours and an atmosphere is a blend of nitrogen and hydrogen. The y values in the examples 0.1 and the z range values are 0.012-0.02. These values fall within the range of claim 6. The taught phosphor is blended with a red and green phosphor and used in a fluorescent lamp, which is known in the art to comprise a gas discharge device that emits ultraviolet radiation of about 250 nm. The reference teaches the claimed process and device.

Claims 1, 22, 23 and 25-29 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. patent 6,805,600 and are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. published patent application 2003/0075705.

U.S. published patent application 2003/0075705 was issued as U.S. patent 6,805,600.

These references teach a phosphor having the formula  $\text{Ba}_{0.9}\text{Eu}_{0.1}\text{Mg}_{0.93}\text{Mn}_{0.07}\text{Al}_{10}\text{O}_{17}$ . This formula falls within that of claim 1. This phosphor is blended with a red phosphor or orange red phosphor. The reference exemplifies blends of  $\text{Ba}_{0.9}\text{Eu}_{0.1}\text{Mg}_{0.93}\text{Mn}_{0.07}\text{Al}_{10}\text{O}_{17}$  and  $\text{Y}_2\text{O}_3:\text{Eu}$ , one of the phosphors of claim 23. This blend is deposited adjacent to a UV/blue light emitting diode, preferably a 396 nm emitting LED. The reference teach the device can be in the formula of a lamp, which has the standard structure where the phosphor blend is dispersed in a transparent casting disposed adjacent to the LED. The references teach the claimed phosphor, blend and device.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6, 7, 10-13, 22, 23, 25, 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-109826.

As stated above, this reference teaches producing phosphor having the formula  $Ba_{1-x-y}Sr_xEu_yMg_{1-z}Mn_zAl_{10}O_{17}$ , where x is 0.4-0.6, y is 0.03-0.3 and z is 0-0.04. The taught y and z values overlap the claimed range since 0.04 falls within the scope of the claimed value of "about 0.05". Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The phosphor is produced by mixing oxides or compounds which generate oxides of Ba, Sr, Mn, Mg, Eu and Al and aluminum fluoride flux and firing the mixture at 1200-1700°C in a reducing atmosphere for 2-40 hours. The examples teach the atmosphere is a blend of nitrogen and hydrogen. The taught time and temperature ranges overlap those claimed. From the examples, one of ordinary skill in the art would have found it obvious to use a mixture of carbonates and oxides as the sources of the elements used in the process. The taught phosphor is blended with a red and green phosphor and used in a fluorescent lamp, which is known in the art to comprise a gas discharge device that emits ultraviolet radiation of about 250 nm. While the reference does not teach the type of lamps, it is well known that the most conventional type of fluorescent lamp are mercury gas lamps. Thus, one of ordinary skill in the art would have found it obvious to use a mercury gas lamp as the taught lamps. The taught red phosphor is



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$\text{Y}_2\text{O}_3\text{:Eu}$  and the green phosphor  $\text{LaPO}_4\text{:Ce,Tb}$ , two of the phosphors of claim 23. The reference suggests the claimed phosphor, blend and device.

Claims 1, 6, 7, 10-13, 22, 23, 25, 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-109826.

As stated above, this reference teaches producing phosphor having the formula  $\text{Ba}_{1-x-y}\text{Sr}_x\text{Eu}_y\text{Mg}_{1-z}\text{Mn}_z\text{Al}_{10}\text{O}_{17}$ , where x is 0.1-0.4, y is 0.075-0.4 and z is 0.005-0.05. The taught y and z values overlap the claimed ranges. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The phosphor is produced by mixing oxides or compounds which generate oxides of Ba, Sr, Mn, Mg, Eu and Al and aluminum fluoride flux and firing the mixture at 1200-1700°C in a reducing atmosphere for 2-40 hours. The examples teach the atmosphere is a blend of nitrogen and hydrogen. The taught time and temperature ranges overlap those claimed. From the examples, one of ordinary skill in the art would have found it obvious to use a mixture of carbonates and oxides as the sources of the elements used in the process. The taught phosphor is blended with a red and green phosphor and used in a fluorescent lamp, which is known in the art to comprise a gas discharge device that emits ultraviolet radiation of about 250 nm. While the reference does not teach the type of lamps, it is well known that the most conventional type of fluorescent lamp are mercury gas lamps. Thus one of ordinary skill in the art would have found it obvious to use a mercury gas lamp as the taught lamps. The taught red phosphor is  $\text{Y}_2\text{O}_3\text{:Eu}$  and the green phosphor

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LaPO<sub>4</sub>:Ce,Tb, two of the phosphors of claim 23. The reference suggests the claimed phosphor, blend and device.

Claims 1, 3, 14, 22, 23 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,805,600 or U.S. published patent application 2003/0075705.

These reference teach a phosphor having the formula (Ba<sub>1-x</sub>Eu<sub>x</sub>)(Mg<sub>1-y</sub>Mn<sub>y</sub>)Al<sub>10</sub>O<sub>17</sub>, where  $0 < x \leq 0.5$  and  $0 < y \leq 0.5$ . These values of x and y overlap the claimed amounts of europium and manganese. The references teach the phosphor can be produced by a co-precipitation process, which is known in the art to comprise providing a first solution containing ions of barium, magnesium, europium, manganese and aluminum, adding a second solution which causes the metal ions to precipitate a compound that will form an oxide upon firing and firing the mixture under a reducing atmosphere at a time and temperature to form the phosphor. As discussed above, the references teach blending this phosphor with a red or orange-red phosphor, such as Y<sub>2</sub>O<sub>3</sub>:Eu. The reference teaches the device where the phosphor blend is disposed adjacent to a UV emitting LED, such as a 396 nm LED can be in the form of a lamp. These lamps are known to have the structure where the phosphor blend is dispersed in a transparent casting which is disposed adjacent to the LED. The references suggest the claimed phosphor, process, blend and device.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,805,600 or U.S. published application 2003/0075705 as applied to claim 29 above, and further in view of U.S. patent 6,252,254.

As discussed above, U.S. patent 6,805,600 and U.S. published application 2003/0075705 teach lamps comprising a UV LED and a blend of a phosphor having the formula (Ba<sub>1</sub>-

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$x\text{Eu}_x)(\text{Mg}_{1-y}\text{Mn}_y)\text{Al}_{10}\text{O}_{17}$ , where  $0 < x \leq 0.5$  and  $0 < y \leq 0.5$  and a red or orange-red phosphor. U.S. patent 6,252,254 shows the standard structure of these lamps, which reads upon that of claim 27. Column 7, lines 11-22 teaches that these lamps can contain scattering particles also dispersed in the transparent casting to reduce the optical saturation effects and to reduce physical damage of the phosphor. Therefore, one of ordinary skill in the art would have found it obvious to include scattering particles in the lamps of U.S. patent 6,805,600 and U.S. published application 2003/0075705 to reduce the optical saturation effects and to reduce physical damage of the phosphor. The references suggest the claimed device.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,805,600 or U.S. published application 2003/0075705 as applied to claim 14 above, and further in view of U.S. patent 6,685,852.

As discussed above, U.S. patent 6,805,600 and U.S. published application 2003/0075705 teach forming the phosphor through co-precipitation, which is known in the art to comprise providing a first solution containing ions of barium, magnesium, europium, manganese and aluminum, adding a second solution which causes the metal ions to precipitate a compound that will form an oxide upon firing and firing the mixture under a reducing atmosphere at a time and temperature to form the phosphor. These references do not give any details of this process, such as what anions in the second solution can be used to precipitate compounds of Ba, Mg, Eu, Mn and Al. U.S. patent 6,685,852 teaches forming aluminate phosphors comprising Ba, Mg, Eu, Mn and Al by co-precipitation, where the second solution comprises ammonium hydroxide or organic amines (col. 4, lines 59-66). One of ordinary skill in the art would have found it obvious to use the ammonium hydroxide or organic amine solution as the precipitating solution in the

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process of U.S. patent 6,805,600 and U.S. published application 2003/0075705. The references suggest the claimed process.

Claims 1-3 and 14-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,685,852.

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as U.S. patent 6,685,852 at the time this invention was made, or was subject to a joint research agreement at the time this invention was made. However, the reference additionally qualifies as prior art under another subsection of 35 U.S.C. 102, and therefore, is not disqualified as prior art under 35 U.S.C. 103(c).

Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the invention of this application, and is therefore, not the invention "by another," or by antedating the applied art under 37 CFR 1.131.

This reference teaches a light source comprising a UV/blue light LED which emits wavelengths in the range of 350-400 nm as the radiation source and a transparent casting adjacent to the LED comprising scattering particles a blend of at least two phosphors, where one phosphor has the formula  $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$  and the other can be one of the phosphors of claim 24, which emit yellow, blue or blue-green. Column 4, lines 1-5 teaches that this phosphor actual has the formula  $\text{AMgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$ , where A is at least one of Ba, Ca and Sr and that the amount of europium is less than 20% of the total amount of A and europium and that the amount of manganese is less than 20% of the total amount of magnesium and manganese. The taught amounts of europium and manganese overlap those claimed. Thus the reference suggests the compositions of claims 1-3. The reference teaches the phosphor are

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produced by a co-precipitation process where a first solution comprising the desired metals are combined with a second solution containing ammonium hydroxide or organic amines to precipitate compounds of the metals that can be converted to the phosphor upon heating in a reducing atmosphere at a temperature greater than 900°C for a time sufficient to produce the phosphor. These temperature and time ranges overlap the claimed ranges. While the reference does not teach the composition of the reducing atmosphere, one of ordinary skill in the art would have found it obvious to use any well known reducing atmosphere, such as the combination of nitrogen and hydrogen, the product of an incomplete combustion of carbon in air or a hydrazine atmosphere. The reference suggests the claimed device, blend, process and phosphor.

Claims 1-3, 5-8, 10-13, 25 and 31 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,611,959.

This reference teaches phosphors used in rare gas discharge lamps. These lamps are known to have a gas discharge device as a radiation source that emits radiation in the range of about 250-480 nm. The phosphor has the formula  $(M_{1-x}Eu_x)O^*a(M'_{1-y}Mn_y)^*(5.5-5a)Al_2O_3$ , where  $0 < a \leq 2$ ,  $x$  is 0.1-0.5,  $y$  is 0-0.2.  $M$  is Sr and at least one of Ca or Ba and  $M'$  is Mg and/or Zn. The examples show that  $a$  is preferably 1. Thus the reference suggests a phosphor with the formula  $MM'Al_{10}O_{17}$ , where  $M$  is Sr and at least one of Ca or Ba,  $x$  is 0.1-0.5,  $y$  is 0-0.2 and  $M'$  is Mg and/or Zn, which suggests that both Mg and Zn are present, where the amount of zinc is greater than 0 up to less than 100 at% of the total amount of Zn, Mg and Mn. This formula overlaps those claimed. The reference teaches that the phosphor is produced by combining oxides or carbonates of the required metals with a flux selected from fluorides of magnesium, barium or aluminum and firing this mixture in a reducing atmosphere at 1200-1700°C for 2-40

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hours. The claimed temperature and time ranges overlaps those claimed. The taught atmosphere can be a mixture of nitrogen and hydrogen or the product of an incomplete combustion of carbon in air. The reference suggests the claimed phosphor, process and device.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,611,959 as applied to claim 6 above, and further in view of U.S. patent 5,735,921.

U.S. patent 5,611,959 teaches the use of any reducing atmosphere in the taught process. It does not teach the use of ammonia or hydrazine. U.S. patent 5,735,921 teaches the use of hydrazine will produce a reducing atmosphere that is functionally equivalent to hydrogen and carbon monoxide atmospheres taught in U.S. patent 5,611,959. Thus, one of ordinary skill in the art would have found it obvious to use a hydrazine atmosphere as the reducing atmosphere of U.S. patent 5,611,959. The reference suggests the claimed process.

Claims 1, 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,096,243.

Column 4, lines 5-9 teaches a phosphor having the formula  $(\text{Ba}_{1-b-c-d}\text{Sr}_b\text{Ca}_c\text{Eu}_d)(\text{Mg}_{1-f-g}\text{Zn}_f\text{Mn}_g)\text{Al}_{10}\text{O}_{17}$ , where  $0 \leq b < 1$ ,  $0 \leq c < 1$ ,  $0 \leq f < 1$ ,  $0 \leq g < 1$  and  $0 < d < 1$ . This composition overlaps the claimed formula. The reference suggests the claimed phosphor.

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

There is no teaching or suggestion in the cited art of record of the claimed phosphor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk  
July 15, 2005

  
C. Melissa Koslow  
Primary Examiner  
Tech. Center 1700